Remarks

Reconsideration of this Application is respectfully requested.

Claims 1-5 and 21-25 are pending in the application, with claims 1 and 21 being the independent claims. Claims 21-25 are withdrawn. Claims 6-20 were previously canceled without prejudice or disclaimer of the subject matter therein. Applicants reserve the right to prosecute similar or broader claims, with respect to the canceled and amended claims, in the future.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Election Restriction

Claims 21-25 were withdrawn from further consideration pursuant to 37 C.F.R. 1.142(b), as allegedly being drawn to a non-elected invention, there being no allowable generic or linking claim. Applicants timely traverse the restriction (election) requirement in the reply filed on April 24, 2006.

Applicants submit that claim 1 is generic of at least one or more claims in this application. Therefore, upon allowance of claim 1, Applicants respectfully request rejoinder and allowance of claims 21-25, which claims include all the limitations of an allowable claim. *See* M.P.E.P. §821.04. Specifically, claim 21 recites the vibration isolation system of claim 1 plus some additional apparatus. Accordingly, if claim 1 is allowable, claim 21 should equally be allowable.

Rejections under 35 U.S.C. § 102

In View of Tatsuya

Claims 1-5 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by JP112433 ("Tatsuya"). The rejection is respectfully traversed.

The Examiner contends that Tatsuya teaches each of the elements of independent claim 1. Applicants respectfully disagree. Claim 1 recites a vibration isolation system for at least partially damping and isolating vibrations of a body, the system comprising:

> a plurality of active isolator devices mechanically coupled to the body; and
> a control system configured to control the active isolator devices, wherein the control system is configured to:
> decouple vibrations in modal directions;
> determine a modal compensation signal for each modal direction;
> recouple each modal compensation signal into an active isolator control signal for each active isolator device; and
> stabilize at least one unstable natural mode of the body.

Applicants maintain that Tatsuya does not teach or suggest each and every feature of claim 1. For example, Tatsuya does not teach or suggest "*a control system configured to control the active isolator devices, wherein the control system is configured to: decouple vibrations in modal directions; determine a modal compensation signal for each modal direction; recouple each modal compensation signal into an active isolator control signal for each active isolator device; and stabilize at least one unstable natural mode of the body*," as recited in claim 1.

Tatsuya discloses an efficient actuator control and unnecessary actuator heat prevention. A controller (11) carries out oscillation control and position control of an exposure body portion (40). The controller (11) controls a plurality of actuators (7A-7D and

32A-32C) based on outputs of displacement sensors (10Z1-10Z3, 10Y1, 10Y2, and 10X) and oscillation sensors (5Z1-5Z3, 5Y1, 5Y2, and 5X). Tatsuya discloses a method that efficient control of the actuators in accordance with an operation mode of the moving body may be realized, and excessive driving of the actuators may be avoided. Thus, unnecessary heating of the actuators can be prevented. However, nowhere in Tatsuya it is taught or suggested that the control system is configured to: decouple vibrations in modal directions; determine a modal compensation signal for each modal direction; recouple each modal compensation signal into an active isolator control signal for each active isolator device; and stabilize at least one unstable natural mode of the body.

Tatsuya discloses a control device (11) as a block diagram of Drawing 5. A first coordinate transformation section (42) inputs the variation rate of the 6 degrees of freedom directions (X, Y, Z, X_θ, Y_θ, and Z_θ) of a center of gravity of the exposure body and changes them into amount (x, y, z, θ_x, θ_y, and θ_z) (Tatsuya Para. 0060). This is similar to sensor decoupling (SD) illustrated in FIG.3 of instant Specification as the prior art. FIG. 3 of the instant Specification shows a control diagram of a prior art active vibration isolation system. Paragraph [0049] of the instant Specification states:

> The body may move in a number of degrees of freedom, e.g. translations and rotations in a number of directions. Sensors S detect any vibration in the rigid body. Since the sensors may detect vibrations in directions that are not identical to the directions of the degrees of freedom of the rigid body, sensor decoupling SD is performed to obtain vibrations in each degree of freedom. As known to a person skilled in the art, a body such as a metrology frame and projection system PS has six degrees of freedom: translations in three Cartesian directions (x, y and z-directions), and rotations in three Cartesian directions (Rx, Ry, and Rz-directions).

Therefore, Tatsuya does not teach or suggest that the control system is configured to: decouple vibrations in modal directions; determine a modal compensation signal for each modal direction; recouple each modal compensation signal into an active isolator control signal for each active isolator device; and stabilize at least one unstable natural mode of the body.

Therefore, for at least the reasons set forth above, Applicants submit that independent claim 1 is patentable over Tatsuya.

Claims 2-5, all of which depend from independent claim 1, are also patentable over Tatsuya for reasons similar to those set forth above with respect to independent claim 1, and further in view of their own respective features.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-5, and find the claims allowable over the applied reference.

In View of Masato

Claims 1-5 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by JP 10-275756 ("Masato"). The rejection is respectfully traversed.

The Examiner contends that Masato teaches each of the elements of independent claim 1. Applicants respectfully disagree. Claim 1 recites a vibration isolation system for at least partially damping and isolating vibrations of a body, the system comprising:

> a plurality of active isolator devices mechanically coupled to the body; and
> a control system configured to control the active isolator devices, wherein the control system is configured to:
> decouple vibrations in modal directions;
> determine a modal compensation signal for each modal direction;

> recouple each modal compensation signal into an active isolator control signal for each active isolator device; and
>
> stabilize at least one unstable natural mode of the body.

Applicants maintain that Masato does not teach or suggest each and every feature of claim 1. For example, Masato does not teach or suggest "*a control system configured to control the active isolator devices, wherein the control system is configured to: decouple vibrations in modal directions; determine a modal compensation signal for each modal direction; recouple each modal compensation signal into an active isolator control signal for each active isolator device; and stabilize at least one unstable natural mode of the body*," as recited in claim 1.

Masato discloses a vibration removal equipment and aligner. Dislocation due to vibrations from wafer or reticle replacement of a main exposure body part (40) are converted to dislocation on a reticle stage (101) using the dislocation sensors (10Z1-10X) and a reticle stage coordinate conversion (71). Masato discloses a method for canceling out the calculated dislocation of the reticle stage (101) by reticle stage control (91) of actuators (95X, 95Y, and 95R) on the reticle stage (101), allowing for increased throughput due to reduced time till vibration reduction on the reticle stage (101). However, nowhere in Masato is it taught or suggested that the control system is configured to: decouple vibrations in modal directions; determine a modal compensation signal for each modal direction; recouple each modal compensation signal into an active isolator control signal for each active isolator device; and stabilize at least one unstable natural mode of the body.

Masato discloses a control device (11) as a block diagram of Drawing 5. A first coordinate transformation section (42) inputs the variation rate of the 6 degrees of freedom

directions (X, Y, Z, X_θ, Y_θ, and Z_θ) of a center of gravity of the exposure body and changes them into amount (x, y, z, θ_x, θ_y, and θ_z) (Masato Para. 0027). This is similar to sensor decoupling (SD) illustrated in FIG.3 of instant specification as the prior art. FIG. 3 of the instant specification shows a control diagram of a prior art active vibration isolation system. Paragraph [0049] of the instant specification states:

> The body may move in a number of degrees of freedom, e.g. translations and rotations in a number of directions. Sensors S detect any vibration in the rigid body. Since the sensors may detect vibrations in directions that are not identical to the directions of the degrees of freedom of the rigid body, sensor decoupling SD is performed to obtain vibrations in each degree of freedom. As known to a person skilled in the art, a body such as a metrology frame and projection system PS has six degrees of freedom: translations in three Cartesian directions (x, y and z-directions), and rotations in three Cartesian directions (Rx, Ry, and Rz-directions).

Therefore, Masato does not teach or suggest that the control system is configured to: decouple vibrations in modal directions; determine a modal compensation signal for each modal direction; recouple each modal compensation signal into an active isolator control signal for each active isolator device; and stabilize at least one unstable natural mode of the body.

Therefore, for at least the reasons set forth above, Applicants submit that independent claim 1 is patentable over Masato.

Claims 2-5, all of which depend from independent claim 1, are also patentable over Masato for reasons similar to those set forth above with respect to independent claim 1, and further in view of their own respective features.

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection of claims 1-5, and find the claims allowable over the applied reference.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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